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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/677,999 | 09/30/2003 | Aaron P. Tondra | 2672 | 9227 |
| 7590 | 10/05/2005 | | EXAMINER | |
| A. Burgess Lowe 101 East Maple Street North Canton, OH 44720 | | | WEISKOPF, MARIE | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3661 | |

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/677,999

Applicant(s)

TONDRA ET AL.

Examiner

Marie A. Weiskopf

Art Unit

3661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-15 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/30/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-15 have been examined.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "433" has been used to designate both a capacitor and a diode in Figure 4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
 - Page 2, line 1 – "...transmission based output from the..." does not make sense. Examiner suggests changing to "...transmission based *on the* output from the..."
 - Page 3, line 7; page 4, line 14; page 5, line 8 – Vacuum is listed as 100 and should be 10.
 - Page 3, line 16 – The freely rotating support wheel 106 is shown in the drawing as 6 not 106.

- Page 6, lines 4 and 6 – 433 is used to designate both a capacitor and a diode.
- Page 8, line 28 – “anmddetect” is a typo, please change to *and detect*.

Appropriate correction is required.

Claim Objections

4. Claims 3-6, 14, 15 are objected to because of the following informalities:
- Claim 3, line 23 – “...sensor to cause to said propulsion...” should be changed to “...sensor to cause said propulsion...”
 - Claim 4, line 29 – “...propulsion drive motor is follows...” should be changed to “...propulsion drive motor follows...”
 - Claim 5, line 2; Claim 6, line 6 – “...pre-determined characteristic is a based upon...” should be changed to “...pre-determined characteristic is based upon...”
 - Claim 14, line 8; Claim 15, line 12 – “...pre-determined characteristic is a based upon...” should be changed to “...pre-determined characteristic is based upon...”

Appropriate correction is required.

5. Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for not referring back to a preceding claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 9 is dependent on claim 10.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Conner et al. (Pub. No. US 2004/0135537.) Conner et al. discloses a self-propelled appliance, such as a vacuum cleaner, which includes a magnetic field sensor and magnet, comprising:

- In regards to claim 1, a programmable control arrangement for a self-propelled floor care appliance (Abstract), comprising:
 - A self-propelled floor care appliance having a propulsion means for propelling the floor care appliance over a surface to be cleaned (Page 2, paragraph 33)
 - A hall effect sensor positioned in an operative relationship with a handle located on the distal end of an upper housing of said floor care appliance to sense the desired direction and speed of the floor care appliance from the user and provide a corresponding output (Page 3, paragraph 36)
 - A programmable microprocessor to receive the output from the device for outputting a signal according to pre-programmed logic (Page 1, paragraph 5; page 5, paragraph 57)
 - A controller for receiving the signal and providing a voltage to a propulsion means at a corresponding voltage and polarity (Page 5, paragraph 60)

- In regards to claim 2, the hall effect sensor outputs a voltage of varying magnitude based upon the position of the hall effect sensor relative to a magnet embedded in the floor care appliance handle (Page 5, paragraph 59)
- In regards to claim 3, the floor care appliance handle is pushed and pulled by the user to cause the magnet embedded in the handle to move relative to the hall effect sensor to cause the propulsion means to propel the floor care appliance in the forward and reverse direction (Page 5-6, paragraphs 59-60)
- In regards to claim 7, a programmable control arrangement for a self-propelled floor care appliance, comprising:
 - A handle at the distal end of the upper portion of the floor care appliance capable of translating from a neutral position to a forward and reverse position by a user applying a pushing or pulling movement of a varying magnitude amount on the handle (Page 5-6, paragraphs 59-61)
 - Propulsion means for propelling the floor care appliance over a surface to be cleaned (Page 2, paragraph 33)
 - A magnet located adjacent to the handle (See Figure 2, component 222)
 - A hall effect sensor mounted in the handle and positioned in an operative relationship with a magnet, the hall effect sensor generating a voltage of varying magnitude according to the relative position of the hall effect sensor to the magnet as the handle is moved from the neutral position to the forward and reverse positions (Figure 2, component 224; page 5-6, paragraphs 59-61)

- A programmable microprocessor for receiving the varying voltage from the hall effect sensor for outputting a signal according to pre-programmed logic based upon the magnitude of the voltage (Page 5, paragraph 57)
- An H-bridge controller for controlling the flow of current and voltage applied to the propulsion means based upon the signal from the microprocessor (Page 5, paragraph 55)

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4, 5, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conner et al. (Pub. No. US 2004/0135537) in view of Wallach et al. (US 6,925,679.) Conner et al. discloses:

- In regards to claim 4, a microprocessor which is pre-programmed to follow a pre-determined characteristic. Based upon the movement from the user, either urging the vacuum cleaner forward or in reverse, the microprocessor detects the signal and moves the vacuum cleaner accordingly. (Page 5-6, paragraphs 59-60)
- In regards to claim 8, a programmable microprocessor with an H-bridge controller to control the response of the propulsion drive motor based upon signal from the microprocessor. (Page 5, paragraph 55)

Conner et al. does fail to disclose using pulse width to modulate the voltage applied to the propulsion drive motor based upon the position of the handle. Wallach et al. discloses an autonomous vacuum cleaner that uses pulse width to modulate the power to enable the drive mechanism of the vacuum cleaner to be able to work at a variety of speeds. (Column 6, lines 38-40) It would have been obvious to one having ordinary skill in the art at the time of the invention to use pulse width modulation in order to be able to provide a variety of different speeds for the user, which would make the use of the vacuum cleaner more desirable.

- In regards to claims 5 and 8, it is inherent that the pre-determined characteristics of the microprocessor must be based upon a mathematical algorithm. In order to be able to provide the pulse width modulation, it must come from a mathematical algorithm.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallach et al. (US 6,925,679) as applied to claim 4 above, and further in view of Elliott et al. (US 6,313,597.) Both Conner et al. and Wallach fail to disclose the use of a table of values for the pre-determined characteristics. Elliot et al., however, discloses the use of a table of values for a microprocessor in a cleaning apparatus. Elliot et al. discusses having a controller that may be operable in a variety of energization in steps between different value. Elliot et al. states that the data is stored in a look-up table. (Column 2, lines 46-48) Elliot et al. also discusses the need of a look-up table or another particularly cost-effective embodiment. (Column 5, lines 32-41) It would have been obvious to one having ordinary skill in the art at the time of the invention to use a look-up table for the

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values instead of performing the mathematical algorithm every time in order to reduce the amount of clock cycles, or time, that it takes to retrieve the needed data.

11. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conner et al. (Pub. No. US 2004/0135537) in view of Abramson et al. (Pub. No. US 2003/0060928). Conner et al. discloses:

- In regards to claim 10, a programmable control arrangement for a self-propelled floor care appliance, comprising:
 - A self-propelled floor care appliance having a propulsion means for propelling the floor care appliance over a surface to be cleaned (Page 2, paragraph 33)
 - A programmable microprocessor to receive the output from a hall effect sensor for outputting a signal according to pre-programmed logic (Page 5, paragraph 57)
 - A controller for receiving the signal and providing a voltage to a propulsion means at a corresponding voltage and polarity (Page 5, paragraph 60)
- In regards to claim 11, a hall effect sensor outputting a voltage of varying value based upon the readings from the hall effect sensor. (Page 5, paragraph 59)
- In regards to claim 12, a user pushing or pulling a handle located on the distal end of the floor care appliance. (Pages 5-6, paragraphs 59-60)

Conner et al. fails to disclose a hall effect sensor that is positioned in an operative relationship with a wheel located on the main body of the floor care appliance to sense the desired direction from claim 10. Abramson et al., however, does disclose

the use of hall effect, or magnetic field, sensors in an operative relationship with a wheel in a robotic vacuum cleaner. Abramson et al. teaches the use of the hall effect sensors on the wheels it control the navigation system of the vacuum cleaner. (Page 7, paragraphs 98-100) It would have been obvious to one having ordinary skill in the art at the time of the invention to include a hall effect sensor in an operative relationship with a wheel in order to be able to sense the desired direction of the floor care appliance from the user and also to still be able to sense the speed and provide a corresponding output. Also, Conner et al. fails to disclose the hall effect sensor outputting a voltage of varying value based upon the rotation of a series of magnets positioned circumferentially on the wheel past the hall effect sensor from claim 11. Abramson et al. discusses the hall effect sensors sending signals to the control system when being rotated about the wheel. It would have been obvious to one having ordinary skill in the art at the time of the invention to have the hall effect sensors output voltages of varying value based on their position so as to be able to send signals to a controller. Finally, Conner et al. also fails to disclose using a wheel to rotate when the user pushes or pulls on a handle from claim 12. Conner et al. discloses using two support structures sliding past one another to detect the desired speed from the user. It would have been obvious to one having ordinary skill in the art at the time of the invention to use the wheel of Abramson et al. in order to be able to sense the desired direction and also speed of the floor care appliance from the user.

12. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abramson et al. (Pub. No. US 2003/0060928) as applied to claim 11 above, and further in view of Wallach et al. (US 6,952,679.) Both Conner et al. and Abramson et al. fail to disclose the use of pulse width modulation to control the voltage applied to the propulsion drive motor. Wallach et al. discloses an autonomous vacuum cleaner that uses pulse width to modulate the power to enable the drive mechanism of the vacuum cleaner to be able to work at a variety of speeds. (Column 6, lines 38-40) It would have been obvious to one having ordinary skill in the art at the time of the invention to use pulse width modulation in order to be able to provide a variety of different speeds for the user, which would make the use of the vacuum cleaner more desirable.

- In regards to claim 14, it is inherent that the pre-determined characteristics of the microprocessor must be based upon a mathematical algorithm. In order to be able to provide the pulse width modulation, it must come from a mathematical algorithm.

13. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallach et al. (US 6,925,679) as applied to claim 13 above, and further in view of Elliot et al. (US 6,313,597.) Conner et al., Abramson et al. and Wallach et al. fail to disclose the use of a table of values for the pre-determined characteristics. Elliot et al., however, discloses the use of a table of values for a microprocessor in a cleaning apparatus. Elliot et al. discusses having a controller that may be operable in a variety of energization in steps between different values. Elliot et al. states that the data is stored in a look-up table. (Column 2, lines 46-48) Elliot et al. discusses the need of a look-up table or another

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particularly cost-effective embodiment. (Column 5, lines 32-41) It would have been obvious to one having ordinary skill in the art at the time of the invention to use a look-up table for the values instead of performing the mathematical algorithm every time in order to reduce the amount of clock cycles, or time, that it takes to retrieve the needed data.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

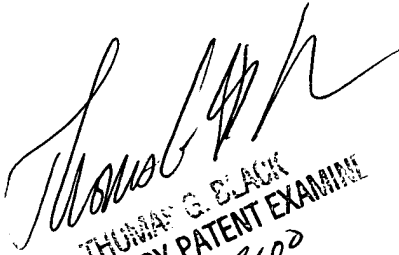
- US Pat. No. 4,709,771 to Basham et al. discloses a speed and steering control for a floor maintenance machine.
- US Pat. No. 5,285,550 to Meyer et al. discloses a self-propelled vacuum cleaner having forward and reverse drive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marie A. Weiskopf whose telephone number is (571) 272-6288. The examiner can normally be reached on Monday-Friday between 7:00 AM and 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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